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ABSTRACT

Online bibliographic searching provides an alternative to the traditional manual literature search to access the already large and rapidly growing literature on agriculture. The advantages of online searching over manual searching are greater speed, increased accuracy, and the capability of searching for any combination of topics at once. The major databases devoted to agricultural topics include three produced by the U.S. Department of Agriculture: Agricultural On-line Access (AGRICOLA), the Current Research Information Service (CRIS), and the Current Awareness Literature Service (CALS). The British counterpart to AGRICOLA, Commonwealth Agricultural Bureaux (CAB), also receives major use. If a person desires information on an agricultural topic, any college or university which teaches agriculture can provide access to these databases at a nominal fee. With the advent of online searching, the difficulty of access which has curtailed the use of agricultural literature should be partly overcome. Two figures illustrating the principles of online searching are included. (JL)

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FINDING THE FACTS ABOUT AGRICULTURE:

A NEW APPROACH TO SEARCHING THE LITERATURE

by

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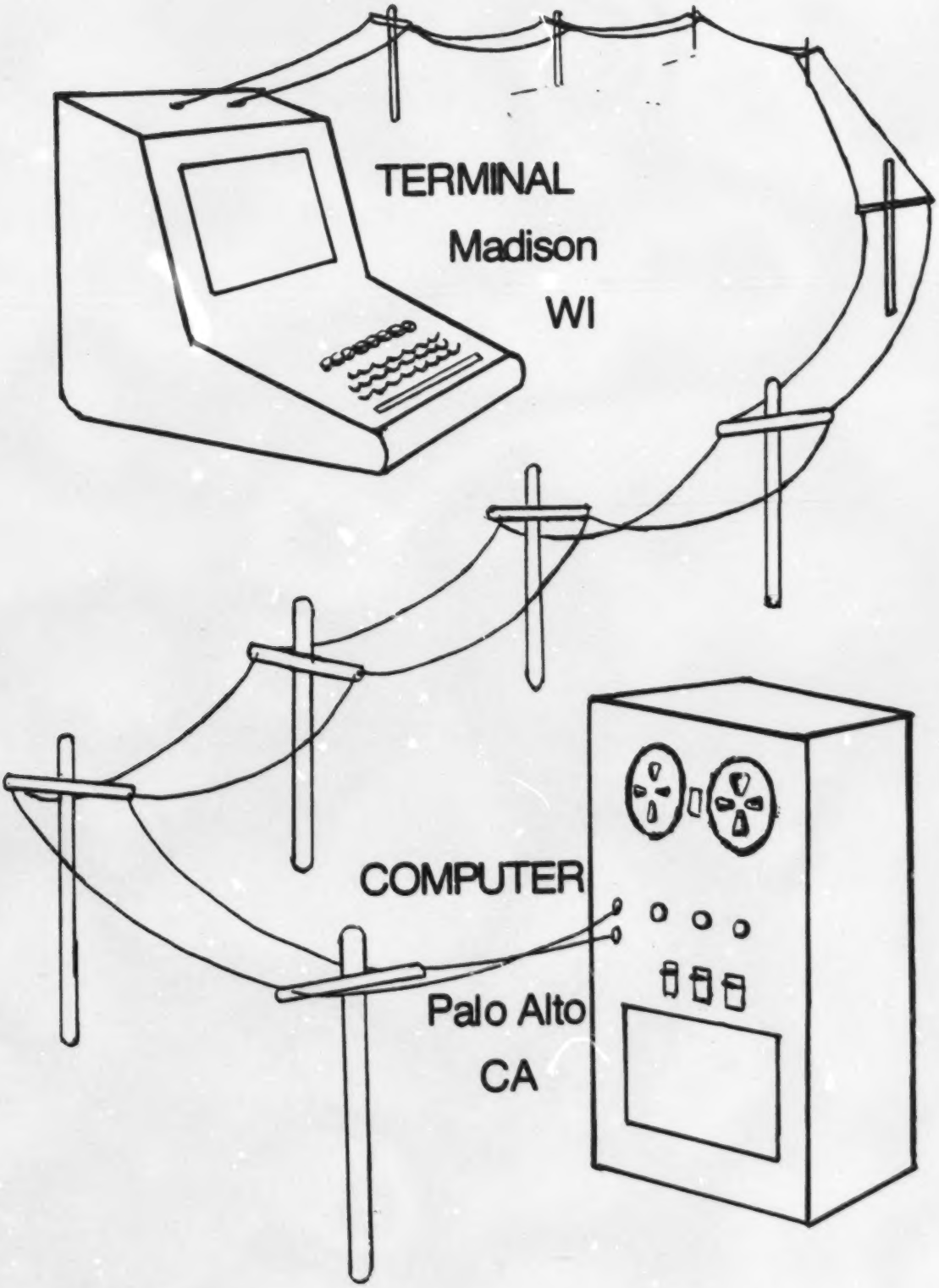
The literature on agriculture is so large and grows at such a rapid rate that it is impossible for anyone to read it all. Even a specialist in only a small part of the subject would have a difficult time to peruse all the books, articles, and reports that pour from the printing presses each year. The vast size and rapid expansion of this literature is made clear when it is realized that the National Agricultural Library in Beltsville, Maryland, probably the world's largest of its kind, holds 1,632,945 books, more than 250,000 microforms, and 22,000 journals (titles).[1] These books and journals are received from all over the world and are written in many different languages. Not only is the retrospective literature on agriculture huge, current production is also large. In 1979 alone, 432 new titles of books were published in the United States,[2] and 481 in the United Kingdom.[3] Reliable statistics for other nations are not available. Serials, including periodicals and government publications, which exceed 8,000 titles, add more to the bulk and make the task of comprehension more formidable. One has only to examine a monthly issue of the Bibliography of Agriculture, which indexes more than 1,200 current domestic and foreign periodicals and numerous federal and state bulletins, to be impressed with the array of print on agriculture. Its British counterpart, published in the form of 25 abstract journals on agriculture and applied biology, indexes and abstracts 8,500 serials in 37 different languages. There is, of course, considerable duplication between the two titles.

The literature on agriculture is not a discrete, neatly packaged body of print. Since it is overlapping rather than homogeneous, much of it appears in books and journals on biology, chemistry, physics, conservation, economics, sociology, veterinary science, nutrition, and perhaps other subjects as well. A person wishing to do an exhaustive search on a specific topic would, as a minimum, have to examine the Dictionary Catalog of the National Agricultural Library, the Bibliography of Agriculture, the Biological and Agriculture Index, Biological Abstracts, Chemical Abstracts, the appropriate CAB abstract journal, and, varying with the topic, perhaps other sources. All of the titles just mentioned are multi-volume works and some have complicated indexes. To perform such a search would require many hours and in some cases many days. The chance of error is always high in manual searching. Another obstacle to successfully searching agricultural literature is finding all of the bibliography within reasonable distance of one's residence. For the most part only the libraries which are part of the universities which teach agriculture would have it all, plus perhaps a few research laboratories. In the case of Illinois, probably this would be eight or nine locations, and in some states it would be fewer. Thus, finding the facts about agriculture in the traditional manner can be a formidable and time consuming task.

Much of the time requirement, the risk of error, the tedium, and the problem of distance from a centralized collection of sources has been reduced or obviated since the advent of what is called "online bibliographical data base searching." What this rather cumbersome phrase means is that the citations to articles and books contained in printed indexes, abstracts, and catalogs are converted to machine readable form, stored in a computer, and retrieved via an electronic terminal using conventional telephone lines. (See Figure I.) Distance between the terminal and the computer, except

Figure 1



for differences in time zones, is relatively of no importance. The operator of the terminal must, however, be knowledgeable of the data base (i.e.,) the content of the records) and the computer program, and skillful in operating the terminal. The latter two parts can be learned in ten to twenty hours of combined instruction, study, and practice.

Online bibliographic data base searching has grown rapidly in recent years because of the advantages it has over manual searching of the literature. The advantages are (1) greater speed, (2) increased accuracy, and (3) the capability to search subjects in combination or, contrarywise, exclude one subject from another. All three points are interrelated and require some explanation.

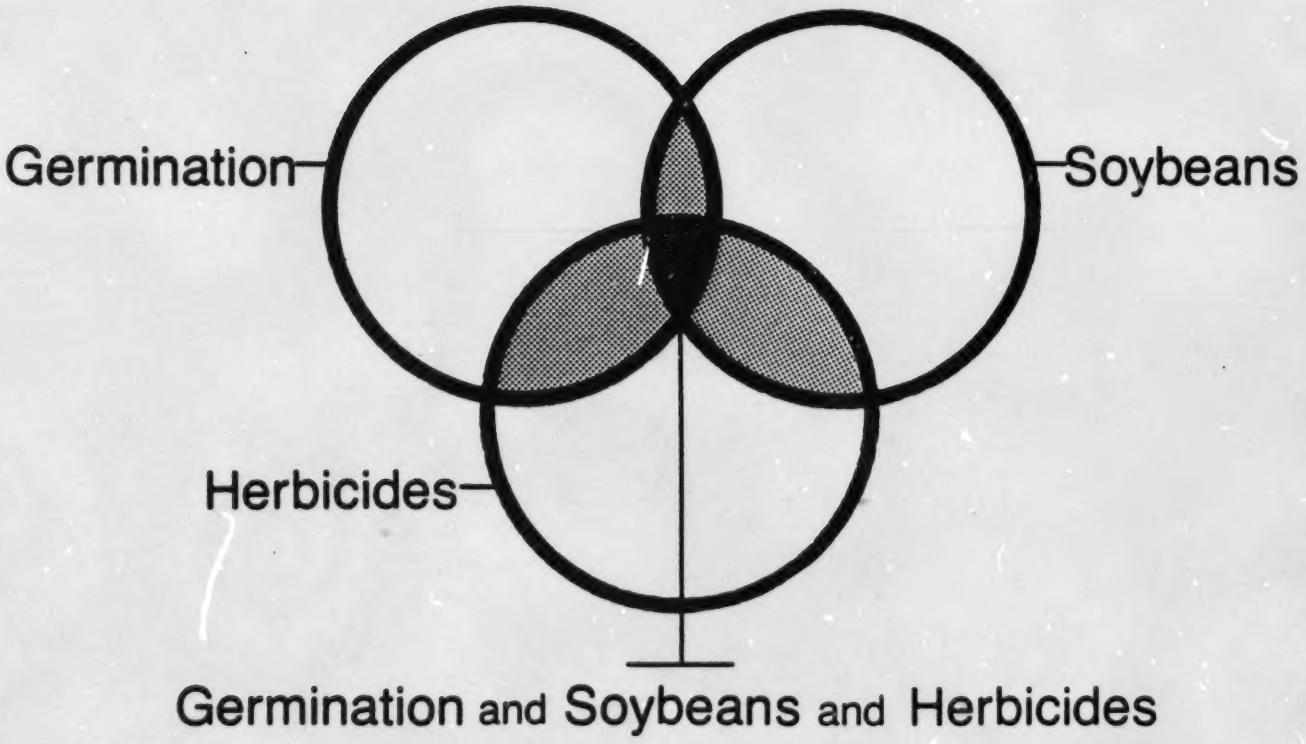
The savings in time is clearly one of the greatest advantages of online searching. As mentioned earlier, to search a subject manually through all the appropriate catalogs and indexes (at least five as a rule) may require several full days of work. This is the greatest deterrant to use of the agricultural literature. The computer, on the other hand, may well perform the task in only a few minutes, usually fewer than 30 and many times fewer than 10.

The computer does occasionally make errors, but such are rare and usually are due to line problems, errors in programming or faulty indexing. When compared to the human errors made in the manual searching of printed indexes and catalogs, the number is small indeed.

The third point, or the capability of the computer to search two or more subjects in combination or exclude one subject from another, probably is the greatest advantage gained by online searching. Figure II shows how this works.

In this example, the purpose of the search is to find reports on the influence of herbicides on the germination of soybean seeds. As shown,

Figure 2


Germination
Soybeans
Herbicides
Germination and Soybeans and Herbicides

the terms GERMINATION, SOYBEANS, AND HERBICIDES would be typed on the terminal and thus relayed to the computer. They would then be combined. The darkened area or the overlapped part of the three circles indicates the part of the total references or citations that related to all three terms. The three partially darkened areas or overlapped parts of two circles represent, in each case, the references that relate to only two of the terms, and the white or clear areas represent citations bearing on only one term. Whenever terms are combined and all must be present in the citations, the resulting total is smaller than the sum of the citations for each term searched separately. If, in this search, it was desired that the effects of moisture (or some other factor) be excluded, the word MOISTURE would be typed on the terminal and combined with the other index terms in this fashion: GERMINATION AND SOYBEANS AND HERBICIDES NOT MOISTURE. Undoubtedly the number of citations would be smaller still.

The above steps can be done in a matter of minutes and essentially all of the world's current literature on agriculture and applied biology can be scanned. Regardless of how many citations are posted, whether 1 or 100, the complete reference to the sources will be given and, in some cases, abstracts of the reports. Those not available locally usually can be borrowed by the nearest library from whatever source holds the report, usually at little or no expense.

Of the numerous data bases on agriculture and related subjects, one dates back to 1967, but most go back only to 1970 or 1973. The 1970 date applies to AGRICOLA (Agricultural On-Line Access), the data base produced by the National Agriculture Library of the U. S. Department of Agriculture. What of the records that predate these years, or, for example, the references and citations that appear in the Bibliography of Agriculture, volumes 1-33,

for years 1942-1969? It is true these records are not in the data base and when an exhaustive search is needed the printed indexes would have to be searched manually. This may not, however, be the disadvantage that it first appears to be. Usually, since a rather specific topic is being searched, the articles or other printed items gained from the computer search will contain references to the earlier published literature on the same topic which can then be obtained. The greatest use is, of course, of the recently published literature and apparently the owners of the data bases believe it will not be cost effective to convert the earlier volumes of the indexes to machine readable form. The bibliographic data bases in agriculture are updated monthly and usually are as recent as three months of publication date.

In addition to AGRICOLA, the United States Department of Agriculture has another useful online data base, called Current Research Information Service (CRIS). This data base supplements AGRICOLA in that it indexes and, in some cases, abstracts research projects recently completed and underway at the time. Most such projects remain active for 3-5 years and are retained in the file for 2 years after completion. Interim reports on active projects are included. Publications emanating from them may or may not appear later in AGRICOLA.

As a means of keeping abreast with developments in agriculture subjects of one's special interest, the U. S. Department of Agriculture offers a related service called Current Awareness Literature Service (CALS). A profile or search strategy can be devised, left on file, and periodically run through a selected group of data bases. Any reports retrieved can be mailed to the patron immediately.

The agriculture data bases just described--AGRICOLA, CRIS, and CALS--are developed at and owned by the United States Agricultural Library at

Beltsville, Maryland. Between them they document the world's output of literature on agriculture and closely related subjects in many languages. There are some restrictions on inclusion, but generally the coverage is broad. The lack of an abstract as a part of the record, except for one or two of the sub-data bases, is a weakness, however. This limitation can be overcome by accessing the British counterpart of AGRICOLA called CAB (Commonwealth Agricultural Bureaux). This data base likewise provides worldwide coverage of the agricultural and biological literature, probably a little more inclusively than AGRICOLA, and, in addition to the bibliographic citation, the record includes an abstract in most cases. This data base extends back to 1973.

It should be made clear at this point that the computerized data bases just described, of which there are now several hundred, are quite different from and unrelated to the computer or electronic data processing (EDP) programs used in farm management, agricultural extension, and applications of like nature.[4] The latter uses are now widespread because of the advantages provided over manual procedures. In all cases the computer is the central store of information, but the programming is quite different and likewise the purpose.

Let's assume, then, that a person needs information on some agricultural subject and wants a search done. How does he go about it? It is safe to assume that any college or university that teaches agriculture can provide this service. Usually it is done by the college library reference service. If not, probably a referral can be made to the nearest place which can offer it. In any case, probably all arrangements can be made by telephone because only a few minutes of conversation are necessary to understand what is desired. After the search is done, the reports containing

the references and/or abstracts can be mailed to the patron directly from the computer installation. About 4-6 days should suffice in all cases. Cost? In most cases there is a charge, but usually for actual costs only, not for profit. Searches can be done on agricultural subjects considerably cheaper than on others because the main data base, AGRICOLA, is owned by and largely subsidized by the USDA. This writer has done a number of such searches, and the average cost is under $20. This is a real bargain, partly because of the greater thoroughness of the search, but also because of the savings in time. Most patrons have been pleased with the results.

Some practitioners dismiss the literature of agriculture, particularly that reporting research, as too theoretical and therefore irrelevant to their needs. This is a limited, distorted view of the situation and is more false than true. Actually, there is something for everyone in the vast literature on agriculture and for all levels and types of operation, as an examination of an issue of the Bibliography of Agriculture or one of the many CAB journals will reveal. It is the sheer bulk and the limited access that has curtailed use of this literature for so long. Now, with the advent of online bibliographic data base searching, these obstacles are partly overcome.

FOOTNOTES

1. Jaques Cattell Press, ed. American Library Directory, 32nd ed. (New York, R. R. Bowker Co., 1979) p.514.
2. Simora, Filomena, ed. The Bowker Annual of Library & Book Trade Information, 25th ed. (New York, R. R. Bowker Co., 1980) p.447.
3. Ibid., p.515.
4. U. S. Department of Agriculture, Extension Service. Inventory of EDP Programs Used in Agricultural Extension. (Washington, D.C., USDA, 1973).